

CLAIMS

1. Vehicle seat for equipment with shoulder belts connected to a seat
5 backrest (21), comprising an energy absorbing device (1) acting
on the seat backrest, **characterised in that** said energy absorbing
device comprises deformable energy absorbing means (12), with
at least one arcuate area (13,14) of plastically fragmentable
material, opposing the rotation of said seat backrest (21) with
10 respect to a lower seat structure (20), in one direction,
corresponding to a forward-leaning movement of said seat
backrest.
2. Vehicle seat according to claim 1, **characterised in that** said
15 deformable energy absorbing means comprise
at least one disc with at least one radially positioned arcuate area
of plastically fragmentable material, and
at least one stop plug acting upon said arcuate area of
fragmentable material in said disc.
- 20 3. Vehicle seat according claim 2, **characterised in that** said disc(s)
comprise at least two radially positioned arcuate areas of
plastically fragmentable material and at least two corresponding
stop plugs.
- 25 4. Vehicle seat according to any one of the preceding claims,
characterised in that said energy absorbing device comprises a
first part (2) connected to the lower seat structure (21),
respectively to the lower portion of the seat backrest (20), rotably

interconnected with a second part (4) connected to the lower portion of the seat backrest (20), respectively to the lower seat structure (21), via said deformable energy absorbing means (12) ,
5 whereas the axis of rotation of said rotably interconnected first part (2) and second part (4) is positioned substantially along or in the vicinity of the hip joint axis in the profile of an average occupant.

5. Vehicle seat according to claim 4, **characterised in that** releasable retention means (16) are provided between said first
10 part (2) and said second part (4), allowing the rotation of said first part with respect to said second part into the direction opposite to said one direction, corresponding to a backward-leaning direction of the seat backrest, without acting on said energy absorbing means, whereas the rotation of said first part with respect to said
15 second part into said one direction is subjected to the reaction of said energy absorbing means.

6. Vehicle seat according to claim 5, **characterised in that** said first
20 part (2) and said second part (4) respectively constitute a support means (2) of the lower seat structure and a shaft (4) connected to the lower portion of the seat backrest, or vice versa, whereas said releasable retention means comprise a ratchet wheel mechanism providing fixed connection of said shaft with respect to said deformable energy absorbing means in
25 said first direction, while providing free rotation of said shaft with respect to said deformable energy absorbing means in said opposite direction.

7. Vehicle seat according to any one of claims 2 to 6, **characterised in that** a backrest recline control is integrated into said energy absorbing device, whereas said disc(s) with one or more area(s) of plastically fragmentable material further comprise one or more
5 corresponding radially positioned arcuate open areas, allowing rotation of the disc(s) from a referenced position, defined with the backrest in upright position, into a direction opposite to the arcuate area of plastically fragmentable material.
- 10 8. Vehicle seat according to any one of the preceding claims, **characterised in that** the seat comprises one energy absorbing device at one side of the seat, whereas the seat backrest is interconnected, on the corresponding side of the seat, to said energy absorbing device via a grooved shaft, and, on the other
15 side of the seat to the energy absorbing device of the adjacent seat or the seat structure, via a free rotating axle.
9. Vehicle seat according to any one of the preceding claims, **characterised in that** said seat is of a type selected from the
20 group comprising surface transport vehicle seats, public transport vehicle seats and air transport vehicle seats,
10. Vehicle seat according to any one of claims 1 - 8, **characterised in that** said seat is an aircraft seat.
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11. Energy absorbing device opposing the rotation of a first part (1) with respect to a second part (2) via deformable energy absorbing means (12) with an arcuate area (13,14) of plastically fragmentable material, **characterised in that** said energy

- absorbing device comprises releasable retention means (16) subjecting every rotation of said first part with respect to said second part into a first direction to the reaction of said energy absorbing means and allowing the rotation of said first part with respect to said second part, into the direction opposite to said first direction, without acting on said energy absorbing means.
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12. Energy absorbing device according to claim 11, **characterised in that** said deformable energy absorbing means comprise
- 10 at least one disc with at least one radially positioned arcuate area of plastically fragmentable material, and
- at least one stop plug acting upon said arcuate area of fragmentable material in said disc.
- 15 13. Energy absorbing device according to claim 12, **characterised in that** said disc(s) comprise at least two radially positioned arcuate areas of plastically fragmentable material and at least two corresponding stop plugs
- 20 14. Energy absorbing device according to any one of claim 11 – 13, **characterised in that** said first part (2) and said second part (4) respectively constitute a support means (2) and a shaft (4), whereas said releasable retention means comprise a ratchet wheel mechanism providing fixed connection of said shaft with
- 25 respect to said deformable energy absorbing means in said first direction, while providing free rotation of said shaft with respect to said deformable energy absorbing means in said opposite direction, or vice versa.

15. Energy absorbing device according to claim 14, characterised in that said shaft comprises a grooved part interconnecting said shaft to a corresponding grooved aperture in said deformable energy absorbing means, said releasable retention means, said disc(s) with radially positioned arcuate area(s) of plastically fragmentable material and/or said ratchet wheel mechanism.